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SHORT REPORT

Spontaneous False Aneurysm of the Supratruncal Abdominal Aorta

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Non-traumatic rupture of the aorta without preexisting aneurysm is rare. Most of the cases reported in literature involve the thoracic aorta.
We report a case of a patient who developed a false aneurysm in a non-dilatated abdominal aorta with its origin just proximal to the celiac trunc due to a penetrating aortic ulceration. After unsuccessful attempts of percutaneous thrombin injections, it was successfully treated with an endovascular stentgraft.

Keywords: Rupture; Spontaneous; False aneurysm; Abdominal aorta; Penetrating aortic ulcer; Endovascular; Thrombin.

Spontaneous atraumatic rupture of the abdominal aorta is very rare. We describe a case of a successfully treated false aneurysm of the supratruncal abdominal aorta.

Case Report

A 84-year-old female patient suffered diffuse atypical abdominal pain and loss of appetite for several weeks. The day she arrived at the emergency department the pain was increasing along with rising back-pain. There was no history of trauma. Her medical history included mitral valve insufficiency with atrial fibrillation, heart failure, hypothyroidism and cholecystectomy. She was on acenocoumarol due to her atrial fibrillation.

On physical examination the right upper abdomen was diffusely painful on palpation. There was normal peristalsis. Blood pressure was 175/90 mmHg, heart rate of 115 bpm. Her temperature was 36.9 °C.

Laboratory values showed: Hemoglobin 7.8 g/dl, increased white blood cell count (11.900 cells/mm), increased CRP (129 mg/l) and acceptable INR (2,4 IE). Fecal impaction was seen on abdominal radiograph. She was admitted to hospital for observation. At that time the clinical diagnosis was fecal impaction. A CT scan of the abdomen revealed a false aneurysm, 5.5 cm in diameter. Aortic calcifications were present. The aorta was of normal caliber at the site of the false aneurysm. Calibration angiography confirmed the false aneurysm with the origin 1.5 cm proximal to the occluded celiac trunk (Fig. 1). The patient's condition remained hemodynamically stable. An attempt was made to treat the false aneurysm with local CT-guided thrombin injection. As control CTA showed only a partial thrombosis of the aneurysm, endovascular stenting was performed through a right femoral arteriotomy to cover the site of aortic perforation including the celiac trunc, while preserving the orifice of the superior mesenteric artery (SMA). Therefore, a wire was placed in the SMA. Preoperatively, intravenous antibiotic prophylaxis was given. The stent graft (Zenith AAA endovascular graft body extension. Cook, Bloomington, Ind) was implanted under fluoroscopic control. Precise positioning during deployment was particularly important in this case because of the limited space for additional stenting.

A completion angiogram showed total exclusion of the false aneurysm.

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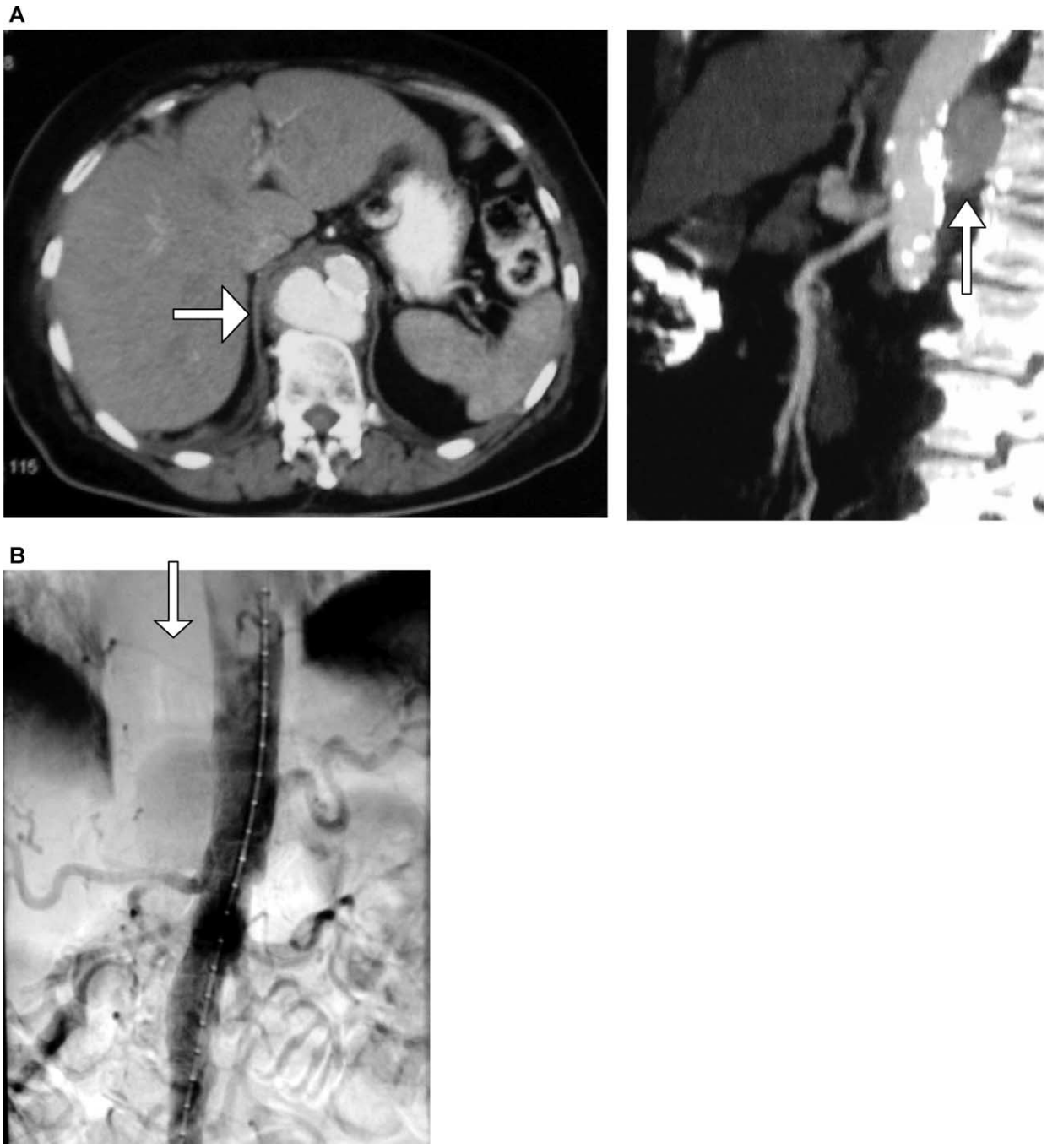

Fig. 1. CT abdomen (A) and angiography (B) revealed the aneurysm spurium just above the celiac trunc. Aortic calcifications are present.

At 3-month follow-up evaluation, CT scan showed no endoleak and no signs of a false aneurysm (Fig. 2).

Discussion

Rupture of the aorta is most frequently seen as a complication of aortic dissection with aneurysmal dilatation of the false lumen, aortic mural disease, or as a result of direct or indirect trauma. A false aneurysm lacks all the three layers of a normal artery and, in fact, represents a pulsatile hematoma surrounded by fibrous tissue. Spontaneous rupture occurs without a preexisting aneurysm or an aortic dissection. The aortic tear, which may be induced by sudden hypertension, is most commonly associated with

Fig. 2. Follow-up CT scan (3D image): Total exclusion of the aneurysm spurium.

fixed atherosclerotic plaques, cystic medionecrosis, or mural thinning of the aortic wall due to long-term steroid therapy.[1,2] In our case, the false aneurysm of the abdominal aorta was most probably due to a perforation through an atheromatous plaque, or caused by a chronic penetrating aortic ulcer (PAU) with calcification, because the abdominal aorta showed severe atherosclerosis and no evidence of a preexisting aneurysm.

PAU of the aorta was first described by Shennan in 1934[3] and recognized as a distinct clinical and pathologic entity by Stanson *et al.* in 1986.[4]

PAU of the aorta is defined as an ulcerating atherosclerotic lesion that penetrates the elastic lamina. It is associated with haematoma formation within the media of the aortic wall and can lead to aortic dissection, aortic aneurysm, or rupture.[4] Even the aortic wall with minimal atherosclerosis could have mini-penetrating arteriosclerotic ulcers, which could lead to fatal aortic rupture.[1] PAU generally affects elderly patients with advanced atherosclerosis. As a result, PAU is associated with a high morbidity. PAU are found almost exclusively in the descending thoracic aorta.[2,5–9] Actual incidence of PAU is unknown.[5,10] It is likely that our patient had an aortic ulcer just above the celiac trunk that led to a contained rupture. As a result she remained hemodynamically stable. PAU may be diagnosed at CT and conventional aortography.

Thrombin is a hemostatic agent approved for topical use on the surface of bleeding tissue. Thrombin clots the fibrinogen in blood directly. Percutaneous, image-guided, thrombin injection has been shown to be effective in treating pseudoaneurysms of various sites and etiologies.[11] Feld *et al.* reported successful thrombin injection after failed stent graft repair of a pseudoaneurysm at the junction of the thoracic and abdominal aorta.[12] Criado *et al.* successfully repaired an abdominal aortic pseudoaneurysm involving the origin of the superior mesenteric artery by translumінal thrombin injection of the sac and exclusion with endovascular stenting.[13]

The surgical treatment of aneurysms confined to the suprarenal abdominal aorta requires an extensive surgical exposure and supraceliac or thoracic aortic clamping. Endovascular stent grafting of thoracic aneurysms was first described by the Stanford group.[14] Endovascular treatment is considered an evolutionary step towards less invasive surgical intervention for vascular diseases. It potentially also represents the alternative mode of treatment for patients whose conditions are unfit for open surgery, mainly because of severe concomitant cardiopulmonary disease. Initial results of endovascular treatment of PAU are satisfactory.[6,9,10,15] Radiologic imaging follow-up is mandatory to detect late complications. Further investigations of the long-term results of this procedure are necessary.

Spontaneous non-traumatic rupture of the abdominal aorta must be considered in the differential diagnosis of patients presenting with abdominal pain and back-pain, hypertension, and anemia.

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